

Work Order ID 92067

October-22-12 3:17:07 PM

\*92067\*

135/445

Page 1

Item ID: 647.1602

Accepted

\*N900040100\*

Setup Start

\*NS1\*

Revision ID:

**Item Name:** Doubler Assembly

Stop \*NS2\*

Start Date: 22/10/2012 Start Qty: 600

\*6\*

### Cust Item ID

Required Date: 05/11/2012 Req'd Qty: 6,000

\*6\*

### **Customer:**

#### Reference:

Approvals:      Process Plan:      My 

Date: 12-10-22 Tooling

Data

## Run Start

\*ND1\*

OC:

Date: \_\_\_\_\_ SPC (Y)

Date:

Stop

\*END2\*

NCR: Yes / No

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order: _____			DISPOSITION		AGAINST DEPARTMENT/PROCESS					
			Rework <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>			
			Scrap <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Quality <input type="checkbox"/>			
			Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>			
			Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>				
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector	
Doc/Data										
Equip/Tooling										
Operator										
Material										
Setup										
Other										
Process										
Supplier										
Training										
Unapproved										
FAULT CATEGORY										
<b>Landing Gear</b> <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped. <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions						
				<input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Other						

Work Order ID 92067

October-22-12 3:17:07 PM

\*92067\*

Page 2

Item ID: 647.1602

Accept

\*N900040100\*

Setup Start

\*NS1\*

Revision ID:

Item Name: Doubler Assembly

Stop

\*NS2\*

Start Date: 22/10/2012 Start Qty: 6.00

\*6\*

Cust Item ID:

Required Date: 05/11/2012 Req'd Qty: 6.00

\*6\*

Customer:

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:		Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140	Identify as per dwg & Stock Location: <i>ST 137A</i>	0.00							
<b>*140*</b> Packaging	Memo	0.00							
Packaging	***IDENTIFY AS PER APICAL MPP-120 BY STAMPING THE P# AND REV***								<i>SP 13-4-23</i>
150	QC21- Final Inspection - Work Order Release	0.00							
<b>*150*</b> QC	Memo	0.00							
Quality Control									<i>MF 13-4-23</i>

NCR: Yes / No

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order: _____			<b>DISPOSITION</b>		<b>AGAINST DEPARTMENT/PROCESS</b>					
			Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>	Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/>	Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/>	Water Jet <input type="checkbox"/> Prod. Eng. Coor. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/>	Engineering <input type="checkbox"/> Quality <input type="checkbox"/> Other <input type="checkbox"/>			
Part No. _____		NCR No. _____								
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector	
Doc/Data <input type="checkbox"/> Equip/Tooling <input type="checkbox"/> Operator <input type="checkbox"/> Material <input type="checkbox"/> Setup <input type="checkbox"/> Other <input type="checkbox"/> Process <input type="checkbox"/> Supplier <input type="checkbox"/> Training <input type="checkbox"/> Unapproved <input type="checkbox"/>										
<b>FAULT CATEGORY</b>										
<b>Landing Gear</b> <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped. <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions						
				<input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <hr/> <hr/> <hr/>						
				<input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <hr/>						
				<input type="checkbox"/> Other						

# Picklist Print

October-22-12 3:17:12 PM

Page 1

Work Order ID: 92067

\*92067\*

Parent Item: 647.1602

\*647 1602\*

Parent Item Name: Doubler Assembly

Start Date: 22/10/2012

Required Date: 05/11/2012

Start Qty: 6.00

Required Qty: 6.00

Comments: IPP REV:A 12.10.04 NEW ISSUE DD VERF:JFS

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
647.1613		Manufactured	No				Each	0.0000		6			

\*647 1613\*

Doubler

92069

\*\*

6 ~~10~~ 13-4-22

MS21059-3

\*MS21059-3\*

Nut Plate

Purchased

No

Each

250.0000

24

\*\*

CCR264SS3-04

\*CCR264SS3-A4\*

RIVET

Purchased

No

Location  
ST316  
123023  
123301

Loc Qty  
250  
50  
200

Loc Code

Each

646.0000

48

~~10~~ 13-4-22

\*\*

CCR264SS3-3

123265

10

See ATTACHED

124259

38

EMAIL

~~10~~

NCR: Yes / No

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order: _____			DISPOSITION			AGAINST DEPARTMENT/PROCESS					
			Rework <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>				
			Scrap <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Quality <input type="checkbox"/>				
			Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>				
			Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>					
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data											
Equip/Tooling											
Operator											
Material											
Setup											
Other											
Process											
Supplier											
Training											
Unapproved											
FAULT CATEGORY											
Landing Gear				General							
<input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped. <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				<input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio							
				<input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions							
				<input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge							
				<input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled							
				<input type="checkbox"/> Other							

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NOTES:

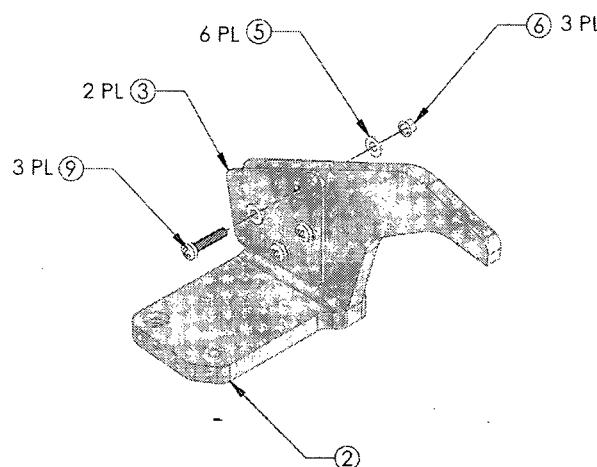
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MATERIAL: ALUMINUM 2024-T3 PER AMS QQ-A-250/4

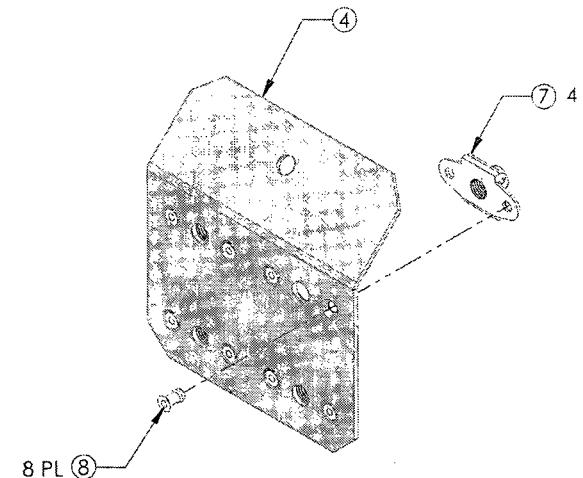
FINISH: HARD ANODIZE IAW MIL-A-8625 TYPE III,  
CLASS 2, COLOR BLACK;  
CARDINAL 4860-50 PRETREATMENT PRIMER  
PRIME IAW MIL-P-23377J TYPE I CLASS N

4. DEBURR AND BREAK ALL SHARP EDGES

5. IDENTIFY IAW MPP-120



647.1601 SHOWN EXPLODED



647.1602 SHOWN EXPLODED

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED  
SUBJECT TO ANNIHILATION  
WITHOUT NOTICE

WORK ORDER  
NO. 92067 MLS

12-10-22

QTY	3	9	601.2989	SCREW	MS27039-012		
QTY	8	8	601.2980	NUTPLATE RIVET	CDR2453-034		
QTY	4	7	601.1900	NUTPLATE	MS21069-2		
QTY	3	6	601.2973	LOCKNUT	MS21040-03		
QTY	6	5	601.2764	WASHER	MS21149F-032F		
QTY	1	4	647.1613	DOUBLER			
QTY	2	3	647.1612	SPLICING PLATE	 		
QTY	1	2	647.1611	WIPER DEFLECTOR, AFT	 		
QTY		1	647.1610	WIPER DEFLECTOR, FWD	 		
QTY	X		647.1602	DOUBLER ASSY			
QTY	X		647.1601	WIPER DEFLECTOR ASSY, AFT			
QTY	1602	1601	FIND #	PART #	DESCRIPTION	MATL	SPEC.

PARTS LIST

QTY	3	9	601.2989	SCREW	MS27039-012
QTY	8	8	601.2980	NUTPLATE RIVET	CDR2453-034
QTY	4	7	601.1900	NUTPLATE	MS21069-2
QTY	3	6	601.2973	LOCKNUT	MS21040-03
QTY	6	5	601.2764	WASHER	MS21149F-032F
QTY	1	4	647.1613	DOUBLER	
QTY	2	3	647.1612	SPLICING PLATE	 
QTY	1	2	647.1611	WIPER DEFLECTOR, AFT	 
QTY		1	647.1610	WIPER DEFLECTOR, FWD	 
QTY	X		647.1602	DOUBLER ASSY	
QTY	X		647.1601	WIPER DEFLECTOR ASSY, AFT	

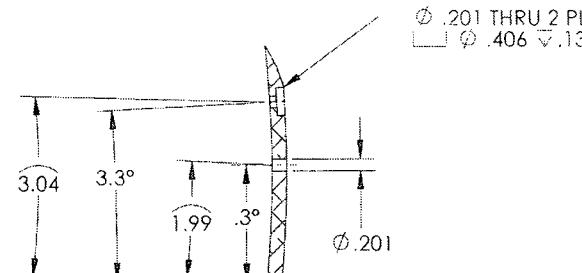
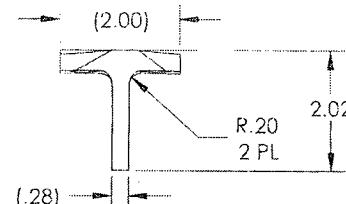
APICAL INDUSTRIES  
2608 TEMPLE HEIGHTS DR,  
OCEANSIDE, CA. 92056-3512 (760)724-5300

WIPER DEFLECTOR ASSY

DATE OTHER THAN SPECIFIED  
REVISIONS APPROVED BY  
TO BE MADE BY  
1. CARDENAL 2. SPANCO  
P. SPANCO  
C. CONTRACTOR

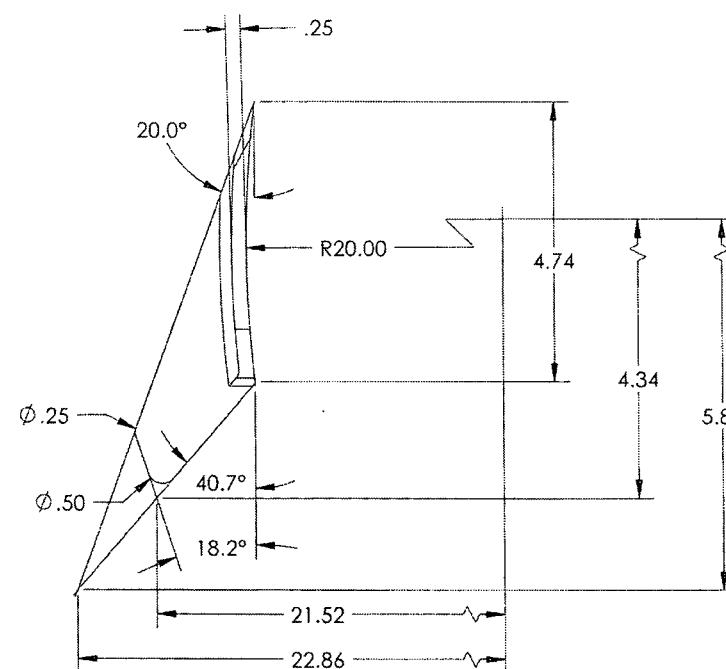
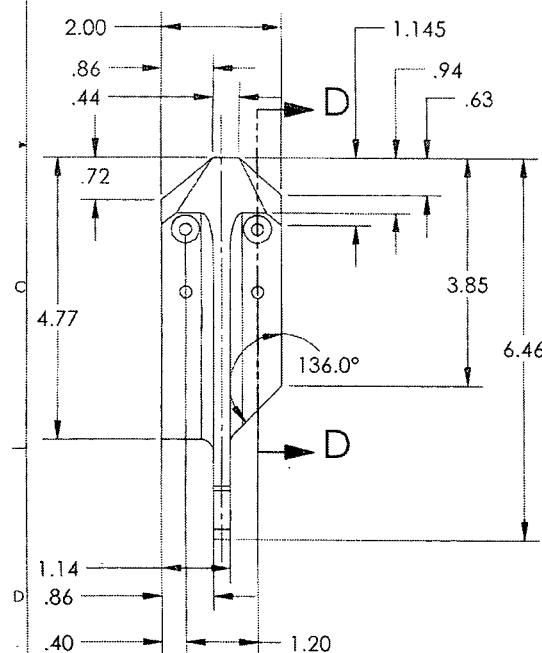
ONE EACH CODE D/C NO. 647.1600 N/C  
B 07M26  
SCALE NONE SHEET 1 OF 5

THE ENGINEERED CONSTRUCTION CO., INC. - READING PRECISION  
ENGINEERING & MANUFACTURING CO., INC. PART OF THE EPC GROUP  
THE COMPANY THAT DESIGN & FABRICATE



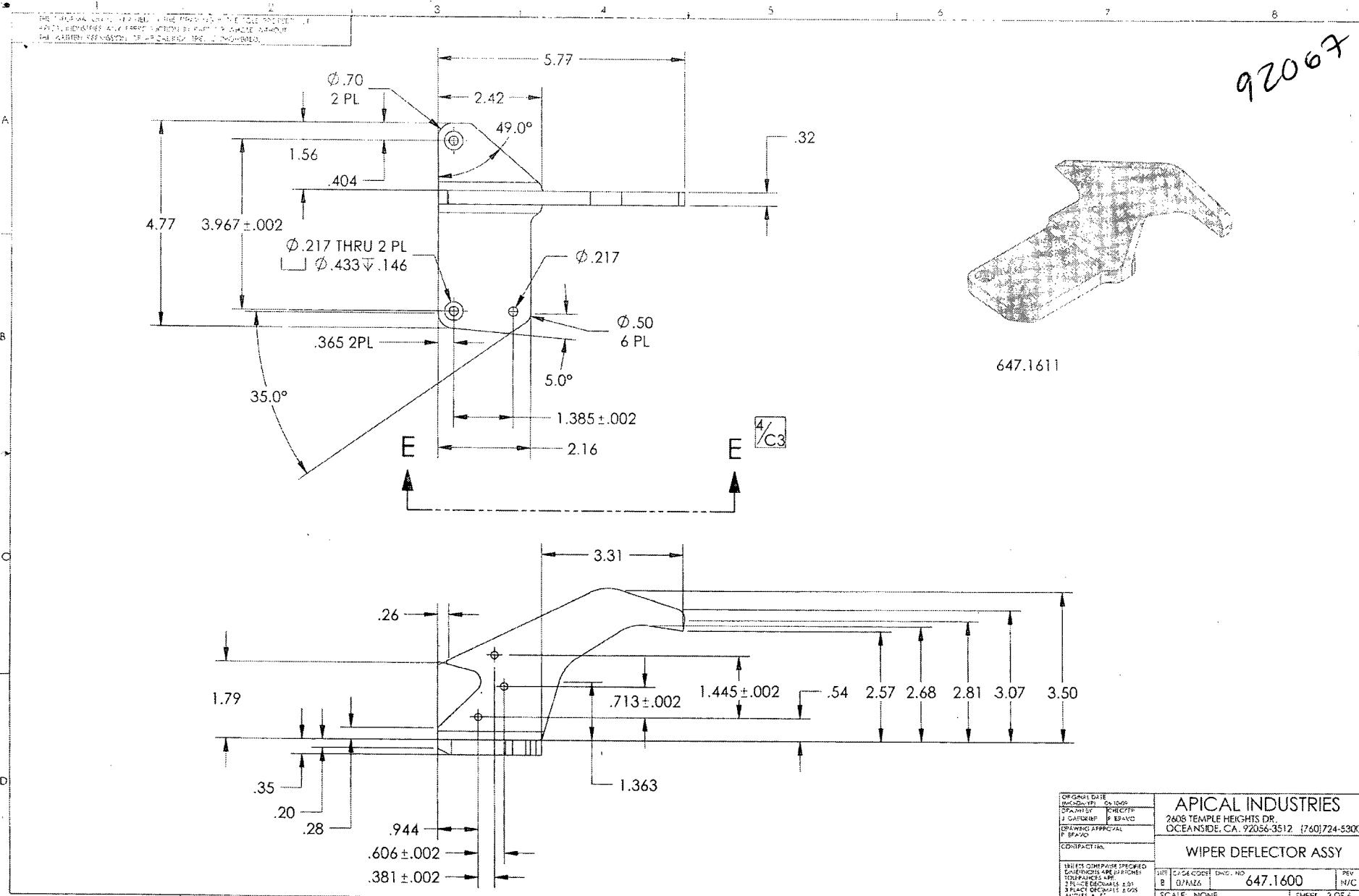
92067

SECTION D-D



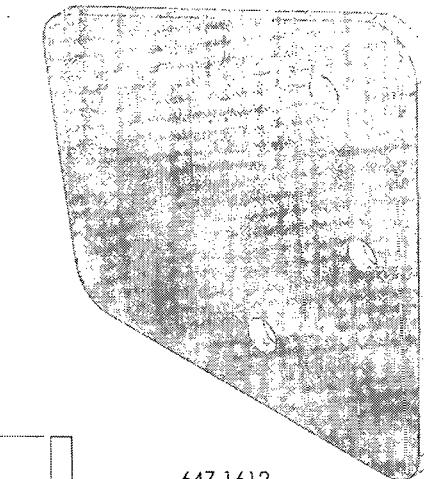
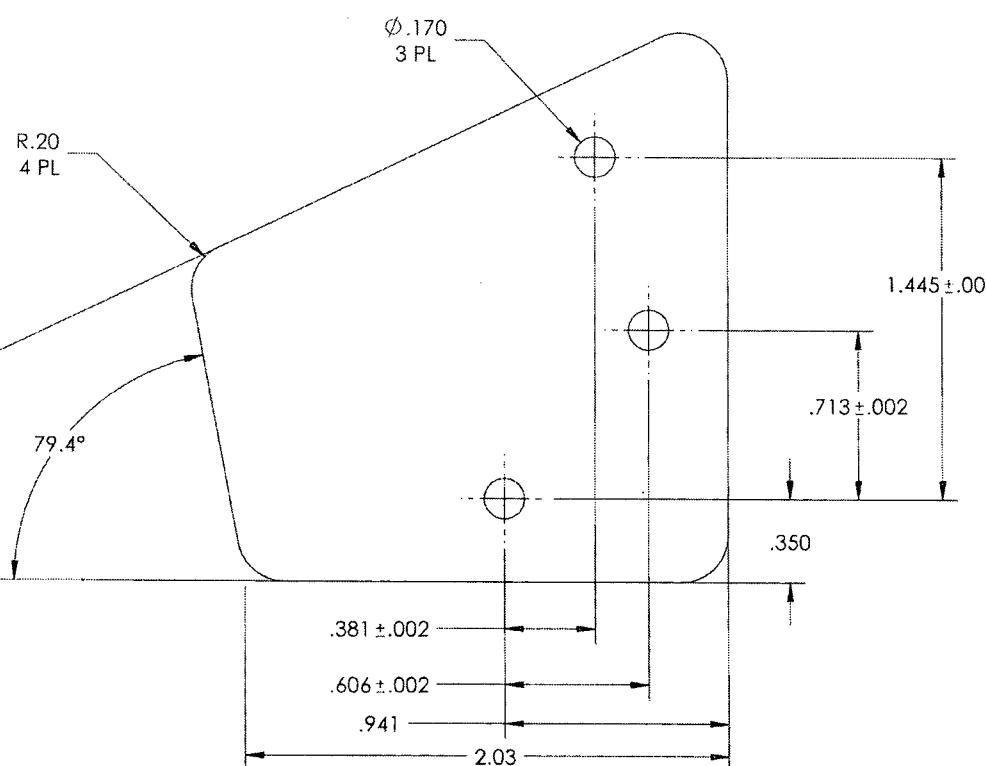
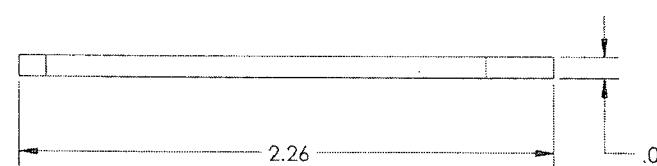
ORIGINAL DATE 04/07/02	REV. 0
DESIGNER P. MEAVO	
CHIEF INSPECTOR P. MEAVO	
SUPERVISOR APPROVAL P. BRAVO	
CONTRACTOR	
INVESTIGATOR APPROVED T. COOPERMAN	
SPC SPECIALIST APPROVED T. COOPERMAN	
SPC DESIGNER APPROVED T. COOPERMAN	
SPC INSPECTOR APPROVED T. COOPERMAN	
SCALE: NONE	REV. N/C
DATE CODE: 04/07/02	DOC. NO. 647.1600
1 SHEET	2 OF 6

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2608 TEMPLE HEIGHTS DR.  
OCEANSIDE, CA 92056-3512 (760)724-5300  
WIPER DEFLECTOR ASSY



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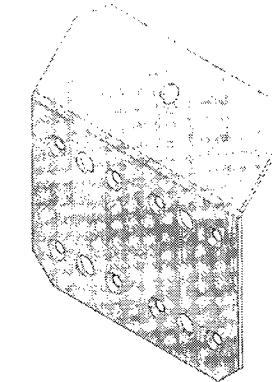
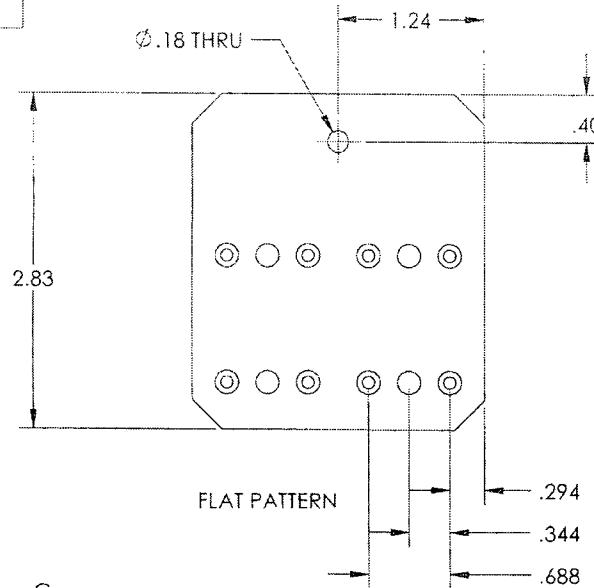
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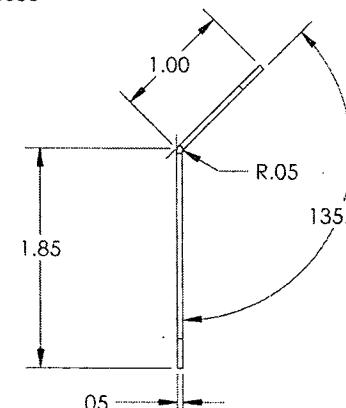
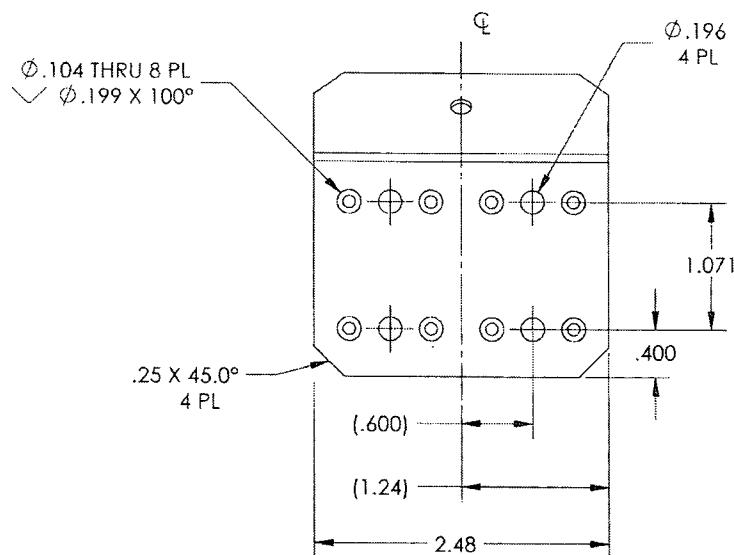
ORIGIN DATE	06/15/02
END DATE	06/15/02
DRAWN BY	CHECER
CHANGED BY	CBKO
SPONSOR APPROVAL	
SPONSOR DATE	
COMTRACTING	
ITEMS CONTRACT SPECIFIED	
ITEMS DRAWN IN INCHES	
SPACE DEPTH	± .01
SPACE DEPTH MAX	± .002
SPACE DEPTH MIN	± .002
SCALE	NONE
REV	N/C
APICAL INDUSTRIES	
2608 TEMPLE HEIGHTS DR.	
OCEANSIDE, CA 92056-3512 (760)724-5300	
WIPER DEFLECTOR ASSY	
ISSUE	07/16/02
DATE	07/16/00
REV	N/C
SCALE	NONE
SHEET	5 OF 6

92067

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647.1613



ORIGINAL DATE 10/04/04	CHANGE 0
DRAWN BY J. CALIFER	CHECKED P. FAYO
DESIGN APPROVED P. FAYO	
CONTRACTOR	
DEEMED CHIEF DESIGNER DIMENSIONS ARE IN INCHES 2 PLACE DECIMALS ± .01 3 PLACE DECIMALS ± .005 4 PLACE DECIMALS ± .001	DATE 10/04/04 PAGE CODE B DRAWING NO. 647.1600 REV N/C SCALE: NONE SHEET 6 OF 6

## APICAL INDUSTRIES

2608 TEMPLE HEIGHTS DR,  
OCEANSIDE, CA 92056-3512 (760)724-5300

## WIPER DEFLECTOR ASSY

## **Jean-Luc Menard**

---

**From:** Alex Quan <[aquan@apicalindustries.com](mailto:aquan@apicalindustries.com)>  
**Sent:** April-18-13 11:34 AM  
**To:** Dave Barker; Jean-Luc Menard; Pablo Bravo  
**Subject:** RE: 647.1602 RIVET LENGTH

JL, you are right. They should be -03 rivets.

Alex

---

**From:** Dave Barker [<mailto:DBarker@dartaero.com>]  
**Sent:** Thursday, April 18, 2013 8:24 AM  
**To:** Jean-Luc Menard; Pablo Bravo; 'Alex Quan' ([aquan@apicalindustries.com](mailto:aquan@apicalindustries.com))  
**Subject:** FW: 647.1602 RIVET LENGTH

JL – Pablo is out of the office, I've added Alex to the email. He should be able to confirm.

Thanks,

Dave

---

**From:** Jean-Luc Menard [<mailto:jmenard@dartaero.com>]  
**Sent:** Thursday, April 18, 2013 5:12 AM  
**To:** Pablo Bravo; 'David Barker'  
**Cc:** Eric Downing  
**Subject:** 647.1602 RIVET LENGTH

Hi Pablo/Dave,  
We have started assembling the nutplates on the 647.1602 .

The dwg currently calls for CCR264SS3-04 that is on the right in the picture, on the left is a -04.  
Think we should go for the -03.

Let me know what think, if you agree, I will issue a ECR.

Thx ,

JL